REMARKS

Reconsideration of the application in view of the above amendments and the following remarks is requested. Claims 1-9 are in this application. Claims 1, 3, 7, and 8 have been amended. Claim 9 has been added to additionally claim the present invention.

The Examiner rejected claims 1-8 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Examiner noted that the phase "the second semiconductor material" in claim 1 lacks antecedent basis. Claim 1 has been amended to correct this inadvertent error. As a result, claim 1 is believed to satisfy the requirements of the second paragraph of section 112. In addition, claims 2-8 are believed to satisfy the requirements of the second paragraph of section 112 for the same reasons as claim 1.

The Examiner rejected claims 1, 2, 7, and 8 under 35 U.S.C. §103(a) as being unpatentable over Klein (U.S. Patent No. 4,205,330) in view of Nagata et al. (U.S. Patent No. 4,015,281). For the reasons set forth below, applicant respectfully traverses this rejection.

Claim 1 has been amended and recites, in part:

> "a first transistor having:
> "a first semiconductor region;
> "spaced-apart source and drain regions formed in the first semiconductor region;
> "a first channel defined between the source and drain regions, the first channel having a first channel length and a first dopant concentration;
> "a layer of first gate oxide formed over the first channel, the layer of first gate oxide having a thickness, and being free of metal atoms and a layer of glass; and
> "a gate formed over the layer of first gate oxide, the gate contacting the layer of first gate oxide;

"the first transistor conducting more than a leakage current when the gate, the source, and the first semiconductor region are connected to a same potential."

Thus, claim 1 requires that the layer of first gate oxide be free of metal atoms and a layer of glass.

In rejecting the claims, the Examiner pointed to the Klein reference as teaching an enhancement-mode transistor and a depletion-mode transistor, where the depletion-mode transistor has a shorter channel length than the enhancement-mode transistor. The Examiner also noted that Klein does not show enhancement-mode and depletion-mode transistors that have gate oxide layers with substantially different thicknesses, but argued that it would obvious to use a thicker layer of gate oxide with the enhancement-mode transistor of Klein in view of Nagata.

The combination of the Klein and Nagata references, however, does not teach or suggest all of the limitations of amended claim 1. As further noted by the Examiner, the Nagata reference teaches in FIG. 9 the use of a double layer of oxide with an enhancement-mode transistor. The double layer of oxide consists of a silicon dioxide (SiO_2) layer 37 and an overlying layer of aluminum oxide (Al_2O_3) 38.

As a result, if the Klein reference was modified to include the gate oxide structure of Nagata, the combined result would have a gate oxide structure that includes metal atoms, namely the aluminum atoms of Al_2O_3 layer 38. Thus, since amended claim 1 recites that the gate oxide layer is free of metal atoms, the combination of the Klein and Nagata references does not teach all of the limitations of amended claim 1.

Further, from what applicant can determine, SiO_2 induces electrons in the surface (see column 6, line 53 of Nagata), and Al_2O_3 38 is utilized specifically to induce holes at the surface (see column 2, lines 53-54 of Nagata). The threshold voltage at the surface can then be varied by varying the thickness ratio of SiO_2 layer 37 and Al_2O_3 layer 38 (see column 6, lines 53-68 of Nagata).

As a result, in view of the Nagata reference, one skilled in the art would not be motivated to use a gate oxide structure that lacks the double oxide structure (i.e., that does not include two oxide layers that have opposite influences on the charge carriers at the surface) because to do so would eliminate the very advantage taught by the Nagata reference.

Thus, since the combination of the Klein and Nagata references does not teach or suggest all of the limitations of amended claim 1, amended claim 1 is patentable over Klein in view of Nagata. In addition, since claim 2 depends from claim 1, claim 2 is patentable over Klein in view of Nagata for the same reasons as claim 1.

The Examiner objected to claims 3-6, but indicated that these claims would be allowable if rewritten to be in independent form to include all of the limitations of the base claim and any intervening claims, and to overcome the 112 rejection. Claim 3 has been amended to be in independent form, and is believed to include all of the limitations of the base claim and any intervening claims, and to overcome the 112 rejection.

Claim 3 was also amended to change the phrase "the first channel length being approximately 30 percent to 80 percent as long as the second channel length" to --the first channel length being shorter the second channel length--. The phrase "the first channel length being approximately 30 percent to 80 percent as long as the second channel length" is added as new claim 9, which is patentable for the same reasons as claim 3.

Claims 4-6 have not been amended to be in independent form as these claims depend either directly or indirectly from claim 3. In addition, claims 7 and 8 have been amended to depend from claim 3. As a result, claims 7 and 8 are believed to be patentable for the same reasons as claim 3.

Thus, for the foregoing reasons, it is submitted that the application is in a condition for allowance. Therefore, the Examiner's early re-examination and reconsideration are respectively requested.

Respectfully submitted,

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